

1       **SYSTEM AND METHOD FOR WIRELESS DEVELOPMENT**  
2                               **PLATFORM**

3  
4                       **Field of the Invention**

5       The invention relates to the field of  
6 communications, and more particularly to a  
7 development platform for the rapid development of  
8 wireless systems such as network-enabled cellular  
9 telephones, and hardware and software components  
10 related thereto.

11                       **Background of the Invention**

12       The wireless communication industry, including  
13 fixed and mobile cellular telephones, one and two-way  
14 paging systems, wireless personal digital assistants,  
15 and other wireless-enabled clients and other devices  
16 has proliferated in recent years. Different classes  
17 of client and other devices have adhered to different  
18 communication protocols, such as the Bluetooth  
19 standard for short-range wireless communication,  
20 802.11a and 802.11b for longer-range open wireless  
21 LANs, CDMA, TDMA and GSM for traditional cellular  
22 telephony, GPS signals for satellite navigation, and  
23 others.

24       In general, there is no universal communications  
25 specification to which builders of new wireless  
26 platforms can design their devices, software and  
27 services. Therefore, the research and validation of  
28 individual systems is done in an ad hoc manner,

2

1 requiring specific test beds and software for each  
2 class of device being assembled.

3 Because of these development constraints,  
4 manufacturers with diverse product lines and others  
5 must buy and maintain separate test equipment for  
6 different product lines. The cost of deploying,  
7 maintaining and updating wireless systems is  
8 therefore increased. Other drawbacks exist.

9

10 Summary of the Invention

11 The invention overcoming these and other  
12 problems in the art relates in one regard to a system  
13 and method for a wireless development platform, the  
14 platform having an extensible set of protocol modules  
15 to selectively add, drop or change the communications  
16 devices and services being prepared. In one  
17 embodiment, the wireless development platform of the  
18 invention may be implemented in a development test  
19 bed, such as a personal computer or workstation,  
20 having slots for receivable protocol modules. The  
21 protocol modules may incorporate programmable logic,  
22 such as logic arrays or processors, that may be  
23 programmed to various test and validation functions  
24 via a user interface. Because hardware design for  
25 diverse devices is unified under one interface and  
26 using a common hardware bed, development and testing  
27 costs may be significantly reduced. In another  
28 embodiment, the development test bed may include or

3

1 interface to portable electronic platforms, such as  
2 notebook computers or other host devices.

3

4 **Brief Description of the Drawings**

5 The invention will be described with reference  
6 to the accompanying drawings, in which like elements  
7 are referenced with like numerals.

8 Figure 1 illustrates a wireless development  
9 platform according to an embodiment of the invention.

10 Figure 2 illustrates a protocol module for use  
11 in a wireless development platform according to an  
12 embodiment of the invention.

13 Figure 3 illustrates a user interface for  
14 manipulating testing and other functions of the  
15 wireless development platform according to an  
16 embodiment of the invention.

17 Figure 4 illustrates a flowchart of development  
18 processing according to an embodiment of the  
19 invention.

20

21 **Detailed Description of Preferred Embodiments**

22 An overall architecture for a wireless  
23 development platform 102 according to the invention  
24 is illustrated in Figure 1. According to this  
25 embodiment, the wireless development platform 102 may  
26 include a host device 104 having an electronic bus  
27 106 receiving one or more of a protocol module 108.  
28 Because the interfaces and protocols used by  
29 different classes of wireless and network-enabled

10026911.1 53407

1 devices are abstracted to removable protocol modules  
2 108, one wireless development platform 102 may be  
3 used to build and exercise a variety of devices, for  
4 instance to test them against standards, perform  
5 stress or burn-in tests or other purposes.

6 In one embodiment, the host device 104 may be,  
7 include or interface to, for instance, a personal  
8 computer running the Microsoft Windows™ 95, 98,  
9 Millenium™, NT™, 2000 or XP™, Windows™CE™,  
10 MacOS™, PalmOS™, Unix, Linux, Solaris™, OS/2™,  
11 BeOS™, MacOS™, VAX VMS or other operating  
12 system or platform. Host device 104 may include  
13 a microprocessor such as an Intel x86-based or  
14 Advanced Micro Devices x86-compatible device, a  
15 Motorola 68K or PowerPC™ device, a MIPS, Hewlett-  
16 Packard Precision™, or Digital Equipment Corp.  
17 Alpha™ RISC processor, a digital signal  
18 processor, a microcontroller or other general or  
19 special purpose device operating under programmed  
20 control.

21 Host device 104 may furthermore include  
22 electronic memory such as RAM (random access  
23 memory) or EPROM (electronically programmable  
24 read only memory), storage such as a hard drive,  
25 CDROM or rewritable CDROM or other magnetic,  
26 optical or other media, and other associated  
27 components connected over the electronic bus 106,



1 initialization, testing, programming, emulating and  
2 otherwise developing communications or other wireless  
3 services. As illustrated in Figure 2, the  
4 development module 108 may contain programmable logic  
5 110, memory 112 and one or more module port 114. The  
6 programmable logic 110 may be, include or interface  
7 to, for instance, the embedded electronics of a  
8 cellular telephone, pager, network-enabled personal  
9 digital assistant or other wireless client to develop  
10 new models or versions of such network-enabled  
11 devices on one universal wireless development  
12 platform 102.

13 The one or more module port 114 of each of the  
14 one or more development module 108 may be, include or  
15 interface to, for example, a universal serial bus  
16 (USB), an integrated device electronics (IDE) bus, or  
17 other connector for testing the operation of  
18 peripheral or other electronics when connected to the  
19 protocol module 108, such as PC Card, SmartCard  
20 storage, infrared or other communications devices, or  
21 other attachments or peripherals. In embodiments,  
22 the protocol module 108 may contain RF circuitry and  
23 an antenna to test radio emissions from the test bed  
24 apparatus.

25 In an embodiment, the development module 108 may  
26 be configured to execute a portable operating system,  
27 such as the WindowsCE™ or Windows2000™ operating  
28 system, a version of the Linux operating system, or  
29 other operating system or environment. When so  
30 configured, software designed for eventual use in a

1002641-100104

1 cellular telephone or other wireless device may be  
2 tested in native mode, executing on the development  
3 module 108.

4 As illustrated in Figure 3, the development  
5 module 108, when inserted for testing and development  
6 in the electronic bus 106 of host device 104, may in  
7 turn execute as a thread or process instance within  
8 the operating system of the host device 104.

9 Features, software settings, protocol selections  
10 and other aspects of the protocol module 108 may be  
11 displayed and manipulated on the user interface 116  
12 of the host device 104, permitting a user to adjust  
13 the configuration of the protocol module 108 to test  
14 and emulate potential new products and enhancements,  
15 such as broadband cellular devices and others. Other  
16 configurations and layers of operating system, file  
17 sharing and other tasks are possible.

18 When a desired configuration is developed, the  
19 protocol and other settings may be stored to a hard  
20 disk, burned into electronic memory (EEPROM) or  
21 otherwise saved for further testing or deployment.  
22 Either one or both of the user interface 116 of the  
23 host device 104 and the operating system of the  
24 protocol module 108 may be configured to execute a  
25 network-enabled client, such as a Web browser like  
26 Microsoft Internet Explorer™, Netscape Communicator™,  
27 Opera™ or others, further reducing development costs  
28 due to standardization and the availability of plugin  
29 modules. According to an embodiment of the  
30 invention, the protocol module 108 may also execute





